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Deciding the Number of Flights

Early in the new year, one of the work projects assigned to Mr. Hirota, an operations manager at Toyo Airlines, was to decide the number of flights to operate on a new route due to be approved in the spring. The new route provides a link between a new provincial airport due to open in April and an airport serving the capital city. It was possible to forecast the level of passenger demand with a fair degree of accuracy based on figures such as the current number of passengers using rail services and neighboring airports. In order to operate on the new route, each airline company has to make an application to the government by January 15 with a proposal for the number of daily flights it wants to offer. As the new route is a domestic service, only domestic carriers are allowed to operate on it, so as things stand applications will not be accepted from operators other than Toyo Airlines and its rival Seiyo Airlines. When making its application, each company must declare how many flights it proposes to operate each day, taking the passenger capacity of its standard aircraft model as the basis for calculation.

A distinctive feature of the passenger airline industry is that the profitability of a route is heavily influenced by the seat occupancy rate. Companies therefore aim as far as possible to make sure that each flight is full, but they risk losing passengers to rivals if they reduce the number of flights. Table 1 shows the results of a simulation by Toyo Airlines of the new route's profitability based on a demand forecast. Table 1 shows the profit yield per flight depending on the total number of daily flights on the new route. It is assumed that passengers will use Toyo Airlines and Seiyo Airlines more or less indiscriminately. As the two companies also have a very similar cost structure, the profit yield per flight should be similar. Seiyo Airlines is likely to have made similar forecasts of passenger demand and the potential profit yield for the two companies.

This case study was created by Associate Professor Atsuomi Obayashi of Keio Business School as a material for class discussion.

The number of flights on the new routes will have very little effect on passenger numbers and profits on other routes. Mr. Hirota has been instructed to maximize profit on the new route from its first year of operation. Seiyo Airlines is likely to have adopted the same policy.

The number of flight slots available for the new route is flexible, and each company is likely to receive approval for whichever number of flights it proposes. However, the company will be obliged to operate the approved number of flights for at least one year. The plan is to review the number of flights in a year's time, at which point the number of flights applied for is likely to be approved again regardless of this year's application. Meanwhile, it is illegal for the airline companies to agree the number of flights between themselves before submitting their proposals. If evidence of such activity is found, the involved parties will be subject to a penalty proportionate to the loss of public benefit and will additionally attract public criticism.

Table 1: Profit forecast for new route

Total no. of flights per day	Annual profit per flight (100 million yen)
1	11.8
2	10.7
3	9.6
4	8.5
5	7.4
6	6.3
7	5.2
8	4.1
9	3.0
10	2.0
11	1.0
12	0.0
13	-1.0
14	-2.0

When the total number of flights is 14 or more, the profit per flight continues to decrease by 100 million yen with each unit increase in the total number of flights.

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